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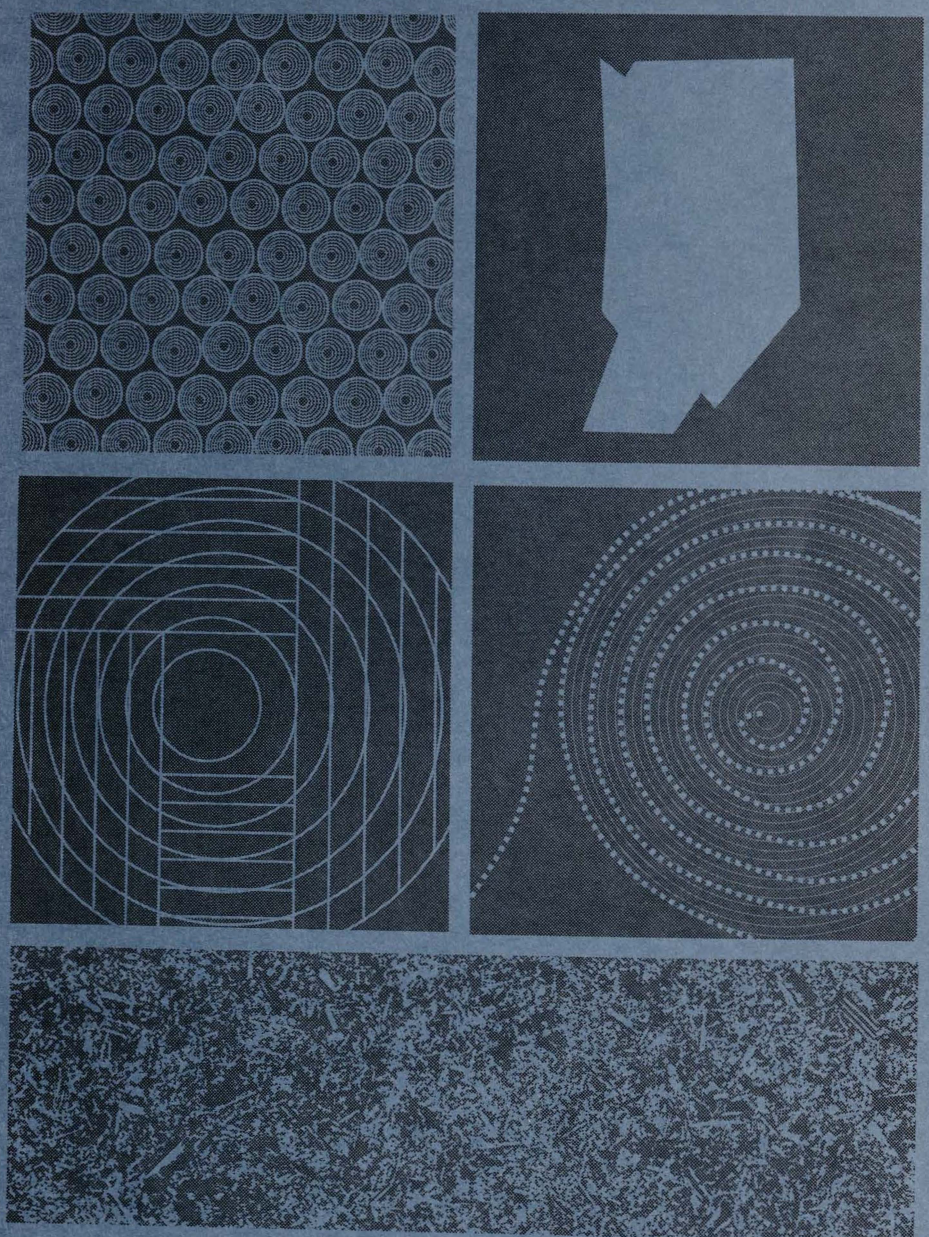
Indiana Timber Industry—An Assessment of Timber Product Output and Use, 1990

Ronald L. Hackett and Robert W. Mayer



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North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
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St. Paul, Minnesota 55108
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FOREWORD

This bulletin discusses recent Indiana forest industry trends and contains the results of a detailed study of the forest industry, industrial roundwood production, and associated primary mill wood and bark residue in Indiana in 1990. Such detailed information is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, and forest industry development. Likewise, researchers need current forest industry and industrial roundwood information for planning projects.

Special thanks are given to the primary wood-using firms that supplied information for this study and to Gary U. Gretter and Glenn T. Durham, foresters for the Indiana Department of Natural Resources, who canvassed these respondents. Their cooperation is greatly appreciated.

All references to red oak in this paper are for the red oak group, which includes black oak as well as northern red oak, cherrybark oak, shumard oak, scarlet oak, southern red oak, shingle oak, and pin oak. Similarly, all references to white oak are for the white oak group, which includes white oak, swamp white oak, bur oak, swamp chestnut oak, chinkapin oak, chestnut oak, and post oak.

All board feet data in this report have been converted to International 1/4-inch scale by applying a multiplier of 1.38 to all saw-log and handle-bolt volumes reported by sawmills and handle mills in Doyle scale and a multiplier of 1.14 to all veneer log and cooperage log volumes reported in Doyle scale by veneer and cooperage mills. To convert to Doyle log scale, multiply the International scale volume for saw logs and handle bolts by 0.7246 and multiply the International scale volume for veneer logs and cooperage logs by 0.8772.

The last report from a detailed study of all industrial roundwood output in Indiana was published in 1984. Most comparisons in this report are with the 1984 study results. Quantities shown may vary slightly from one table to another because of rounding differences, but these differences are insignificant.

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Indiana Timber Industry—An Assessment of Timber Product Output and Use, 1990

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HIGHLIGHTS

PRIMARY TIMBER INDUSTRY—INDUSTRIAL ROUNDWOOD

- Industrial roundwood production rose from 65.6 million cubic feet in 1984 to 80.1 million cubic feet in 1990. Annual production increased 4 percent for hardwoods and declined 17 percent for softwoods.
- Saw logs accounted for more than 90 percent of the industrial roundwood production in 1990.
- In 1990, 76 percent of the total growing stock harvested came from red oak, white oak, yellow-poplar, ash, and hickory.
- Log and bolt receipts at primary mills were 507 million board feet (International 1/4-inch scale). Hardwood receipts increased 30 percent and softwood receipts declined 52 percent since 1984.
- Total material harvested from timberland for industrial roundwood (excluding residential fuelwood) was 143 million cubic feet. Growing stock accounted for 67 percent (96 million cubic feet) of this total.

In 1990, 277 primary wood-using mills were operating in Indiana. Sawmills dominate Indiana's forest industry in terms of volume of wood used. Indiana's production of industrial roundwood is reported by the four Forest Survey Units (fig. 1).

SAW LOGS

- Loggers cut nearly 436 million board feet (International 1/4-inch scale) of Indiana saw logs in 1990, up 23 percent (82 million board feet) since 1984. Nearly 33 percent of the 1990 production was accounted for by species in the red oak group.
- Major saw-log species harvested in 1990 were red oak, yellow-poplar, white oak, and ash. Hickory and beech were the only species that had major declines in production between 1984 and 1990 with 5 and 4 million board feet, respectively (fig. 2).

Ronald L. Hackett, Research Forester, received a B.S. in forest resources from the University of Minnesota. He joined the Forest Service in December 1974 and has been working with the North Central Station's Forest Inventory and Analysis Unit since.

Robert W. Mayer, Forest Products Utilization and Marketing Supervisor, received a B.S. in biology/chemistry from Oakland University and an M.S. in forest management from Michigan State University. He joined the Indiana Division of Forestry in 1977 and assumed his present position in 1988.

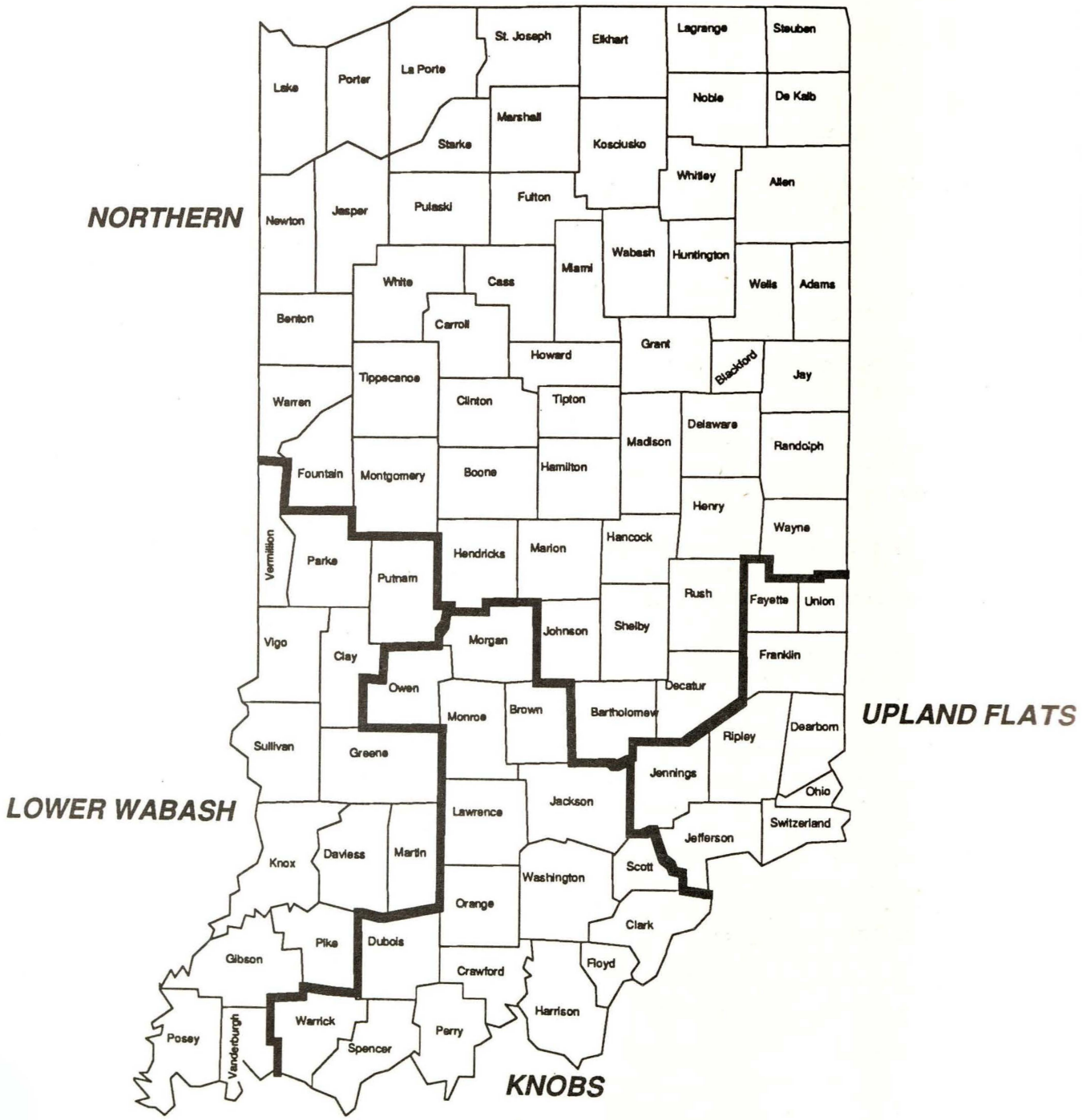


Figure 1.—*Forest Survey Units in Indiana.*

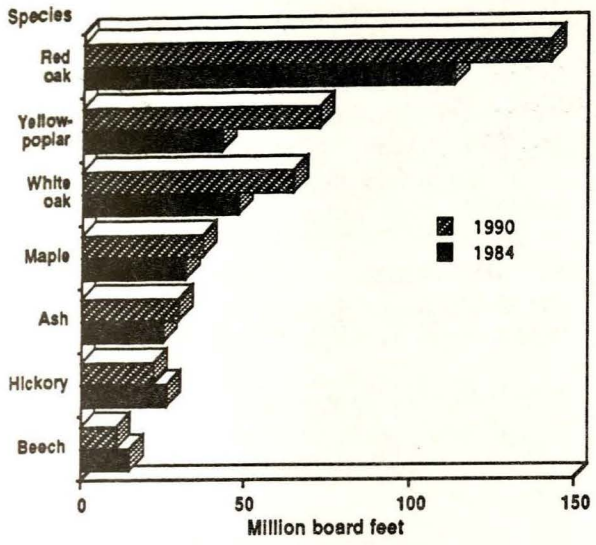


Figure 2.—*Saw-log production in Indiana by selected species group, 1984 and 1990.*

- Saw-log production was highest in the Knobs Unit of Indiana with 204 million board feet or 47 percent of total production for 1990. The Northern and Lower Wabash Units together produced another 46 percent of the total saw logs cut in Indiana.

- One percent of the saw-log volume—primarily red oak, cottonwood, and white oak—was shipped to Illinois, Ohio, Michigan, and other States outside the region.

- In 1990, 246 active sawmills in Indiana received 506.8 million board feet of saw logs; in 1984, 276 sawmills received 391 million board feet.

- Indiana imported a total of nearly 75 million board feet of saw logs from Illinois, Michigan, Kentucky, Ohio, Iowa, and other States. Major imported species were red oak, white oak, black oak, and yellow-poplar.

PULPWOOD

- Indiana produced 189 thousand cords of pulpwood, including mill residues, in 1990. This volume was 8 percent lower than the 1984 production of 206 thousand cords. Pulpwood includes all fiber-based products made from roundwood, including paper, particleboard, oriented strand board (OSB), and waferboard.

- Hardwood residues comprise 79 percent of the pulpwood production in Indiana (fig. 3). Roundwood pulpwood constitutes 4 percent of the industrial roundwood harvested in the State.

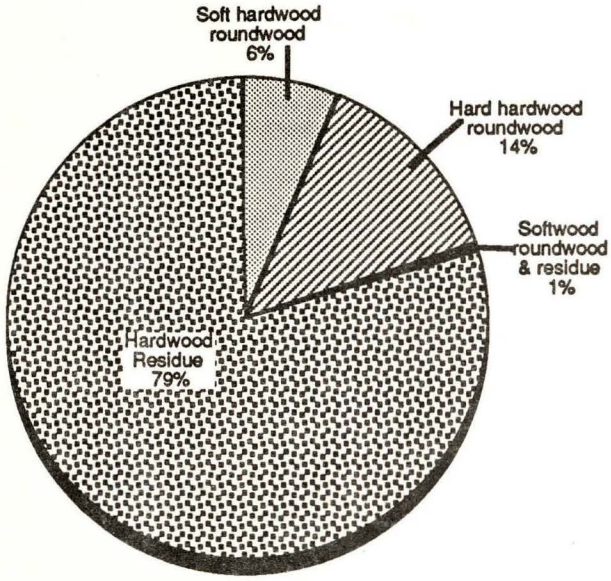


Figure 3.—*Pulpwood by species group and residue production for Indiana, 1990.*

- Sixty-eight percent of the roundwood pulpwood was harvested in the Knobs Unit, and the rest was harvested in the Lower Wabash Unit. Principal species cut in 1990 for pulpwood were hickory, red oak, white oak, hard maple, and cottonwood.

- In addition to the one pulpwood mill operating in the State, Indiana supplied pulpwood mills in Wisconsin, Michigan, Kentucky, and Ohio.

VENEER LOGS

- Loggers cut 16.8 million board feet of Indiana veneer logs in 1990, 18 percent more than in 1984.

- Of the 16.8 million board feet of veneer logs cut in 1990 in Indiana, 73 percent remained in the State, and 18 percent was exported to Ohio. The other 9 percent was exported to other States and countries.

- White oak was the primary veneer species cut in Indiana in 1990, followed by black walnut, red oak, hard maple, and yellow-poplar (fig. 4). White oak and black walnut were the main species exported from Indiana to Ohio and other countries, principally Japan and Germany.

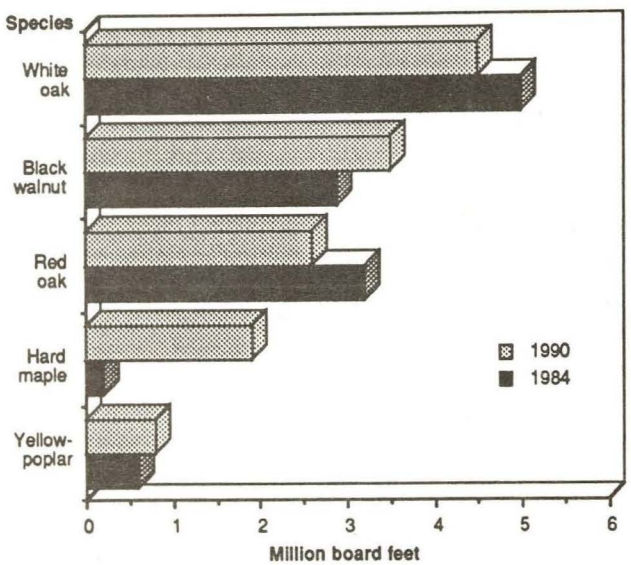


Figure 4.—*Veneer log and bolt production by selected species groups for 1984 and 1990, Indiana.*

- Fourteen Indiana veneer mills received almost 35 million board feet of logs and bolts. Imports totaled 22.6 million board feet from surrounding States and other States outside the region. Five States contributed more than 2 million board feet each of veneer logs and bolts: Pennsylvania, Kentucky, Michigan, Ohio, and Illinois.

- White oak was the major species processed in Indiana, followed by black walnut, black cherry, red oak, and hard maple. Kentucky and Illinois provided 54 percent of the white oak processed in Indiana in 1990. Kentucky and Ohio were the primary sources of black walnut. Pennsylvania furnished 90 percent of the black cherry and 60 percent of the red oak processed in veneer mills in Indiana. Michigan provided 77 percent of the hard maple used for veneer in Indiana.

OTHER PRODUCTS

- Loggers cut 2.2 million cubic feet of other industrial roundwood products in Indiana in 1990. These products include handle bolts, cooperage logs, shaving bolts, and excelsior bolts, etc.

- Handle-bolt harvesting occurred thoughout the State, and ash supplied most of the 6.8 million board feet produced.

- Cooperage log production (5.2 million board feet) was all from white oak, and more than 80 percent was cut in the Knobs Unit.

HARVEST RESIDUE

- During 1990, loggers in Indiana left an estimated 63 million cubic feet of unused wood material on harvested timberlands.

- Red oak, yellow-poplar, white oak, and black oak species groups accounted for 65 percent of all unused wood left after harvesting (harvest residue).

- Logging residue accounted for 21.5 million cubic feet, while logging slash totaled 41.5 million cubic feet.

- Production of harvest residues by Survey Units was:

Survey Unit	Residue volume	
	(Million cubic feet)	(Percent of total)
Lower Wabash	13.7	22
Knobs	29.5	47
Upland Flats	5.0	8
Northern	14.8	23
Total	63.0	100

PRIMARY MILL RESIDUE

- During 1990, Indiana primary wood-using mills (except the pulpmill) generated 730 thousand green tons of coarse residue, 462 thousand green tons of fine residue, and 323 thousand tons of bark.

- More than 80 percent of each residue class (coarse, fine, and bark) generated at Indiana mills was used.

- Pulpwood mills consumed 57 percent of the coarse residue for fiber products, and industry and households consumed 34 percent for fuel.

- Fine residue and bark were used primarily for industrial fuel and soil conditioner, mulch, livestock bedding, and poultry litter.

TIMBER REMOVALS

- In the production of industrial roundwood, 95.9 million cubic feet of growing stock was removed from the timberland in 1990.

- Major species harvested in both growing stock and sawtimber were red oak, white oak, yellow-poplar, and ash.

- In the production of industrial roundwood, 142.9 million cubic feet of timber was cut. Close to half of this total was left in the woods as harvest residue (fig. 5).

- Logging residue accounted for 15 percent or 21.5 million cubic feet of industrial roundwood harvested in Indiana in 1990. Logging slash accounted for 29 percent or 41.5 million cubic feet of material.

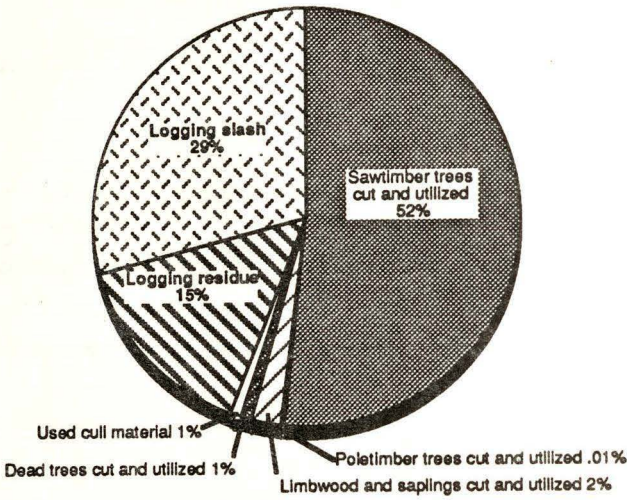

Logging slash 29%
Sawtimber trees cut and utilized 52%
Logging residue 15%
Used cull material 1%
Dead trees cut and utilized 1%
Poletimber trees cut and utilized .01%
Limbwood and saplings cut and utilized 2%

Figure 5.—*Distribution of material from harvested timberland for industrial roundwood in Indiana, 1990.*

APPENDIX

STUDY METHODS

Data for this publication came from responses to a mail questionnaire (see following pages) sent to all known veneer mills, specialty mills (poles, piling, etc.), and all Indiana primary sawmills that processed logs and bolts in 1990.

The study was a cooperative effort of the Indiana Department of Natural Resources (IDNR) and the North Central Forest Experiment Station (NCFES). All canvassing in Indiana was done by the IDNR using mail and personal contacts; followup of nonrespondents was by mail, telephone, and personal contacts. IDNR utilization and marketing specialists provided estimates based on prior knowledge and contacts for a few Indiana mills that did not furnish complete data.

The NCFES mailed a questionnaire to all pulp mills and all out-of-State mills using Indiana roundwood. Followup of nonrespondents was by mail and telephone.

Logging utilization factors were used to estimate the logging residue. These factors were determined from earlier Illinois logging utilization studies by the NCFES during 1984 and 1985. The logging utilization study determines how much of the tree the logger takes for primary timber products and how much of the tree is left at the logging site. This does not account for any secondary wood processors who come in and take other products from the tree such as pulpwood or fuelwood.

The NCFES edited and compiled the data.

Form Approved
OMB No. 0596-0010

LOGS AND OTHER WOOD PROCESSED IN 1990

INDIANA

This form is for reporting the quantities and kinds of logs and other wood processed by this plant in 1990, and the disposition of the wood residues resulting from this operation.

All replies will be held confidential and used only for statistical reports.

☐ Check here if you wish to receive a copy of the report resulting from this study.

Plant or company name: _____

Mailing address: _____

Plant location: _____ **County**

Person to contact about this report: _____

Types of wood processed in 1990. *Check only one kind of product. If more than one kind was received, fill out a separate form for each.*

14-15

01		Saw logs & bolts-- includes veneer logs sawn
02		Veneer logs & bolts cut into veneer
03		Cooperage logs and bolts
04		Handle bolts
06		Piling

07		Poles
10		Posts
11		Charcoal wood
12		Other (specify) _____

☐ Check here if no wood was processed in 1990 and return the form.

Total volume of above-checked product that was processed in 1990.

Conifer (pine, cedar, etc.) _____ Hardwood (includes cottonwood) _____

27-36 37-46

THIS BLOCK FOR OFFICE USE ONLY

Cols. 1-5 = **61100**

MILL	STATE	COUNTY
XXX	XX	XXX

6-8 9-10 11-13

FACTOR
XXX

47-49

MILL SIZE
X

50

A pre-addressed stamped envelope is provided for your convenience.

This survey is authorized by PL 93-378 as amended by PL 94-588. Your cooperation is appreciated and needed to make the results of this survey comprehensive, accurate, and timely, although you are not required to respond.

LOGS and OTHER WOOD PROCESSED IN 1990.

Do not include logs or bolts sold or transferred to other companies. Enter quantity processed opposite species in appropriate columns showing survey units, other states and Canada where the logs and bolts were harvested. The State map on page 4 shows unit boundaries. If the unit of measure is board feet, indicate the log rule or lumber tally. ☐ Doyle ☐ International ☐ Scribner ☐ Lumber tally
If cords, specify size _____. If weight, specify pounds per thousand board feet _____ or pounds per cord _____.

Cols. 1-5 = 612xx or 613xx

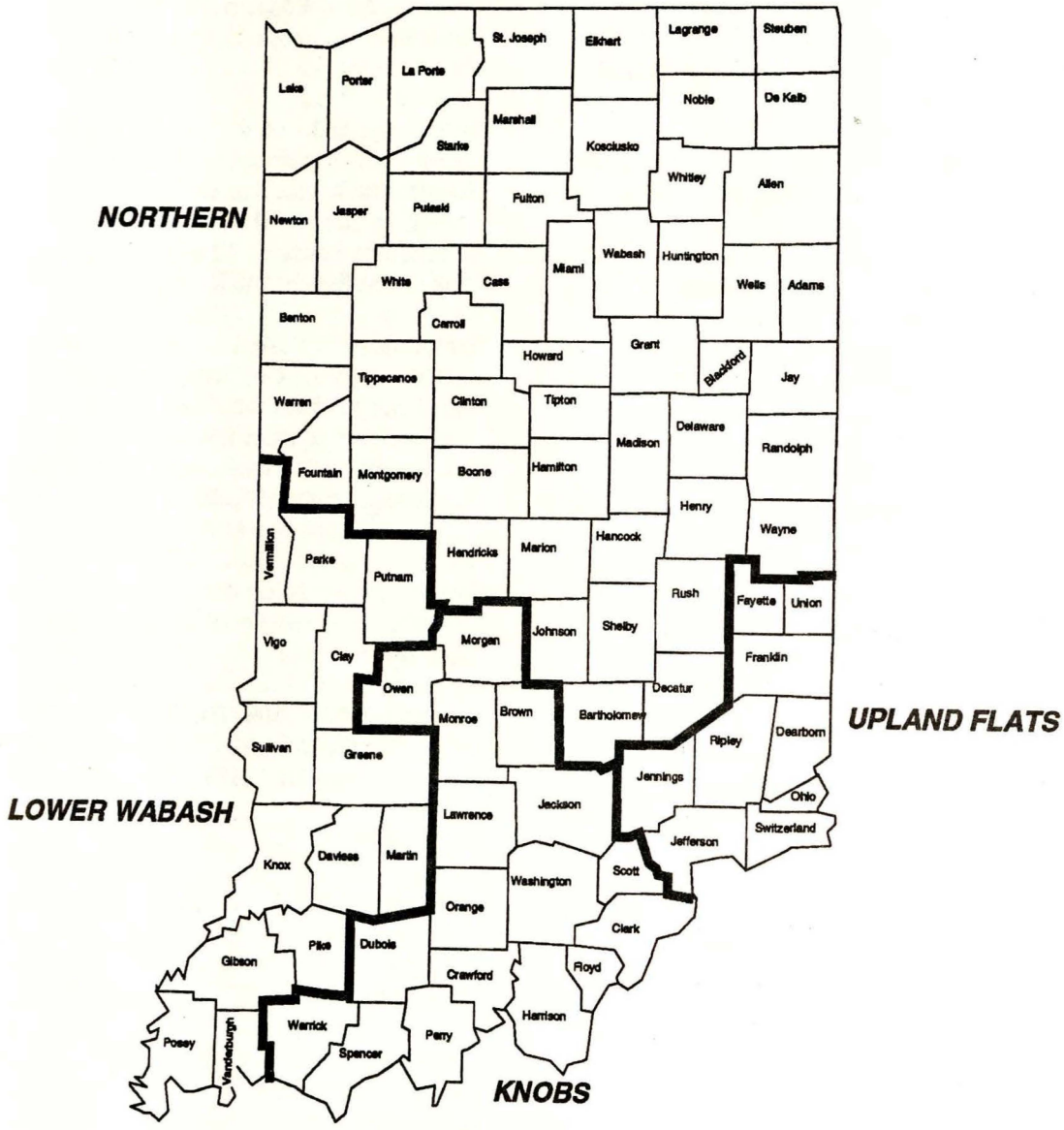
Species	Unit of measure:		FROM INDIANA (enter name of Unit or county immediately below)								OTHER STATES AND CANADA (enter name below)	
	Board feet ☐ Cords ☐ Cubic feet ☐ Lineal feet ☐ Pieces ☐ Weight ☐ Other ☐ _____											
			XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
Cypress	1											
Pine, Shortleaf	2											
Redcedar	3											
Ash	4											
Aspen	5											
Basswood	6											
Beech	7											
Birch	8											
Blackgum	9											
Cherry, Black	10											
Cottonwood	11											
Elm	12											
Hickory, Pecan	13											
Hickory, Other	14											
Maple, Hard	15											
Maple, Soft	16											
Oak, Black	17											
Oak, Red	18											
Oak, White	19											
Sweet Gum	20											
Sycamore	21											
Walnut, Black	22											
Yellow-poplar	23											
Other (specify)	24											
TOTAL												

DISPOSAL OF PLANT RESIDUES IN 1990 BY TYPE AND USE, for product checked on page 1

Instructions: Please enter your best estimate of the **percentage of each type of plant residue** that was used for the various purposes indicated

Cols. 1-5 = 615xx

DISPOSAL OF RESIDUE	BARK		COARSE RESIDUES (Suitable for chipping such as slabs, edgings, etc.)		FINE RESIDUES (Sawdust, veneer, clippings, etc. not suitable for chipping)	
	1 Conifer	2 Hardwood	3 Conifer	4 Hardwood	5 Conifer	6 Hardwood
	XX	XX	XX	XX	XX	XX
1. USED FOR:						
a. Manufacture of fiber products such as pulp, hardboard, or roofing felt 1	%	%	%	%	%	%
b. Charcoal or chemical wood 2	%	%	%	%	%	%
c. Industrial fuel at this or other mill 3	%	%	%	%	%	%
d. Domestic household fuel -- sold or given away 4	%	%	%	%	%	%
e. Miscellaneous uses such as livestock bedding, mulch, small dimension, and specialty items. 5	%	%	%	%	%	%
2. NOT USED: (Including land fill and residues burned as waste. 6	%	%	%	%	%	%
3. TOTAL	%	%	%	%	%	%



Forest Survey Units in Indiana

DEFINITION OF TERMS

Coarse mill residue.—Wood residue suitable for chipping such as slabs, edging, and veneer cores.

Consumption.—The quantity of a commodity, such as saw logs, utilized.

Fine mill residue.—Wood residue not suitable for chipping such as sawdust and veneer clippings.

Forest Survey Unit.—A geographic area (group of counties) used by the Forest Inventory and Analysis Project to report periodic inventories and use of forest resources.

Harvest residues.—The total unused wood material left after harvesting.

Industrial roundwood products.—Saw logs, pulpwood, veneer logs, poles, commercial posts, piling, cooperage logs, particleboard bolts, shaving bolts, lath bolts, charcoal bolts, and chips from roundwood used for pulp or board products.

Industrial roundwood production.—The quantity of industrial roundwood harvested in a geographic area.

Industrial roundwood receipts.—The quantity of industrial roundwood received by commercial mills.

Logging residue.—The unused portions of merchantable trees cut or killed and left by logging.

Logging slash.—The unused portion of unmerchantable trees or unmerchantable portion (limbs, tops) of merchantable trees cut or killed and left by logging.

Primary wood-using mills.—Mills receiving roundwood or chips from roundwood for processing into products.

Primary wood-using mill residue.—Wood materials (coarse and fine) and bark generated at manufacturing plants from roundwood processed into principal products. These residues include wood products (byproducts) obtained incidental to production of principal products and wood materials not utilized for some product.

Roundwood.—Logs, bolts, or other round sections cut from trees (including chips from roundwood).

Standard cord.—A stack of wood bolts (or the equivalent) encompassing 128 cubic feet of wood, bark, and air space. A cord of pulpwood in the North Central Region is assumed to contain 79 cubic feet of wood and 49 cubic feet of bark and air space.

Timberland.—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. Generally, this includes areas suitable for growing crops of industrial wood in excess of 20 cubic feet per acre annually.

Veneer log.— A log considered suitable in size and quality for producing veneer-sliced or rotary-cut.

COMMON AND SCIENTIFIC NAMES OF TREE SPECIES MENTIONED IN THIS REPORT

SOFTWOODS

Pine
- Shortleaf pine ..... *Pinus echinata*
- Virginia pine ..... *Pinus virginiana*
- Eastern white pine ..... *Pinus strobus*
- Red pine ..... *Pinus resinosa*
- Scotch pine ..... *Pinus sylvestris*

Cypress ..... *Taxodium distichum*

Eastern redcedar ..... *Juniperus virginiana*

HARDWOODS

White oak
- White oak ..... *Quercus alba*
- Swamp white oak ..... *Quercus bicolor*
- Bur oak ..... *Quercus macrocarpa*
- Swamp chestnut oak ..... *Quercus michauxii*
- Chinkapin oak ..... *Quercus muehlenbergii*
- Chestnut oak ..... *Quercus prinus*
- Post oak ..... *Quercus stellata*

Red oak
- Northern red oak ..... *Quercus rubra*
- Cherrybark oak ..... *Quercus falcata* var. *pagodaefolia*
- Shumard oak ..... *Quercus shumardi*
- Black oak ..... *Quercus velutina*
- Scarlet oak ..... *Quercus coccinea*

Southern red oak ..... *Quercus falcata*
Shingle oak ..... *Quercus imbricaria*
Pin oak ..... *Quercus palustris*
Hickory
Mockernut hickory ..... *Carya tomentosa*
Shagbark hickory ..... *Carya ovata*
Shellbark hickory ..... *Carya laciniosa*
Pecan ..... *Carya illinoensis*
Pignut hickory ..... *Carya glabra*
Bitternut hickory ..... *Carya cordiformis*
Hard maple ..... *Acer saccharum*
Soft maple
Red maple ..... *Acer rubrum*
Silver maple ..... *Acer saccharinum*
Beech ..... *Fagus grandifolia*
Sweetgum ..... *Liquidambar styraciflua*
Blackgum ..... *Nyssa sylvatica*
Ash
White ash ..... *Fraxinus americana*
Black ash ..... *Fraxinus nigra*
Green ash ..... *Fraxinus pennsylvanica*
Blue ash ..... *Fraxinus quadrangulata*
Cottonwood ..... *Populus deltoides*
Aspen
Bigtooth aspen ..... *Populus grandidentata*
Quaking aspen ..... *Populus tremuloides*
American basswood ..... *Tilia americana*
Yellow-poplar ..... *Liriodendron tulipifera*
Black cherry ..... *Prunus serotina*
Black walnut ..... *Juglans nigra*
Elm
Winged elm ..... *Ulmus alata*
American elm ..... *Ulmus americana*
Siberian elm ..... *Ulmus pumila*
Slippery elm ..... *Ulmus rubra*
Rock elm ..... *Ulmus thomasii*
American sycamore ..... *Platanus occidentalis*
Birch
Yellow birch ..... *Betula alleghaniensis*
River birch ..... *Betula nigra*
Paper birch ..... *Betula papyrifera*
Other hardwoods
Ohio buckeye ..... *Aesculus glabra*
Hackberry ..... *Celtis occidentalis*
Northern catalpa ..... *Catalpa speciosa*
Flowering dogwood ..... *Cornus florida*
Common persimmon ..... *Diospyros virginiana*
Honeylocust ..... *Gleditsia triacanthos*
Kentucky coffeetree ..... *Gymnocladus dioicus*
Butternut ..... *Juglans cineria*
Osage-orange ..... *Maclura pomifera*
Cucumbertree ..... *Magnolia acuminata*
Black locust ..... *Robinia pseudoacacia*
Black willow ..... *Salix nigra*
Sassafras ..... *Sassafras albidum*
Boxelder ..... *Acer negundo*
Balsam poplar ..... *Populus balsamifera*

TABLE TITLES

Table 1.—Number of active primary wood-using mills in Indiana, 1980, 1984, and 1990

Table 2.—Industrial roundwood production by type of mill in Indiana 1966, 1984, and 1990

Table 3.—Industrial roundwood production by Forest Survey Unit, species group, and type of product, Indiana, 1990

Table 4.—Material harvested on timberland for industrial roundwood by source of material and species group, Indiana, 1990

Table 5.—Saw-log production and receipts in Indiana by species group, 1984 and 1990

Table 6.—Saw-log production by Forest Survey Unit and species group, Indiana, 1990

Table 7.—Saw-log production by Forest Survey Unit, species group, and State of destination, Indiana, 1990

Table 8.—Saw-log receipts in Indiana by Forest Survey Unit, species group, and State of origin, 1990

Table 9.—Pulpwood production in Indiana by species group, 1966, 1976, 1984, and 1990

Table 10.—Roundwood pulpwood production by Forest Survey Unit and species group in Indiana, 1990

Table 11.—Veneer log production in Indiana by species group, 1966, 1976, 1984, and 1990

Table 12.—Veneer log and bolt production by species group and destination, Indiana, 1990

Table 13.—Veneer log and bolt receipts in Indiana by species group and State of origin, 1990

Table 14.—Growing-stock removals from timberland for industrial roundwood by Forest Survey Unit and species group, Indiana, 1990

Table 15.—Sawtimber removals from timberland for industrial roundwood by Forest Survey Unit and species group, Indiana, 1990

Table 16.—Harvest residue generated by industrial roundwood harvesting from timberland by Forest Survey Unit and species group, Indiana, 1990

Table 17.—Residue produced at primary wood-using mills by type of material, type of use, and Forest Survey Unit, Indiana, 1990

Table 1.--Number of active primary wood-using mills in Indiana 1980, 1984, and 1990

Kind of mill1/	1980	1984	1990
Sawmills			
Large 2/	99	112	126
Medium 3/	59	47	25
Small 4/	176	117	95
Total	334	276	246
Veneer mills	16	16	14
Handle plants	7	6	4
Cooperage mills	6	4	2
Pulp mills	1	1	1
Other mills5/	3	3	3
Total	367	306	270

1/ Number of active sawmills estimated in 1990.

2/ Annual lumber production in excess of 1 million board feet.

3/ Annual lumber production from 1/2 million to 1 million board feet.

4/ Annual lumber production to 1/2 million board feet.

5/ Includes shavings, cabin logs, and excelsior plants.

Table 2.--Industrial roundwood production by type of mill in Indiana 1966, 1988, and 1990

(In million cubic feet)

	All species		
Kind of mill	1966	1984	1990
Saw logs	32.8	58.9	72.6
Pulpwood	6.8	2.8	3.0
Veneer logs	2.2	1.9	2.3
Other products2/	3.6	2.0	2.2
Total	45.4	65.6	80.1
	Hardwoods		
Saw logs	32.6	58.7	72.6
Pulpwood	6.7	2.8	3.0
Veneer logs	2.2	1.9	2.3
Other products2/	3.6	2.0	2.1
Total	45.1	65.4	80.0
	Softwoods		
Saw logs	0.2	0.2	1/
Pulpwood	0.1	--	--
Veneer logs	--	1/	1/
Other products2/	--	--	0.1
Total	0.3	0.2	0.1

1/ Less than 50 thousand cubic feet.

2/ Includes logs and bolts used for handles, mine timbers, cooperage, poles, pilings and other products.

Table 3.--Industrial roundwood production by Forest Survey Unit, species group, and type of product, Indiana, 1990 1/

ALL UNITS

Species group	Saw logs		Veneer logs		Pulpwood		Handle bolts		Cooperage logs		Other products	All products
	MBF 2/	*MCF 3/*	*MBF 2/*	*MCF 3/*	*Cords 4/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MCF 3/*	*MCF 3/*
HARDWOODS												
Ash	29,995	4,928	640	89	1,901	150	5,897	956	--	--	--	6,123
Aspen	637	103	--	--	926	71	--	--	--	--	--	174
Basswood	3,998	658	8	1	409	33	--	--	--	--	--	692
Beech	11,001	1,809	400	54	1,116	89	--	--	--	--	--	1,952
Birch	250	40	--	--	--	--	--	--	--	--	--	40
Blackgum	1,537	251	15	2	598	47	--	--	--	--	--	300
Black cherry	10,377	1,704	708	97	--	--	--	--	--	--	--	1,801
Cottonwood	8,963	1,392	464	63	3,086	245	--	--	--	--	13	1,713
Elm	1,506	247	10	1	--	--	--	--	--	--	--	248
Pecan hickory	1,287	212	298	40	--	--	--	--	--	--	--	252
Other hickory	21,221	3,487	78	11	7,903	625	248	40	--	--	1	4,164
Hard maple	20,682	3,523	1,895	259	3,313	261	690	112	--	--	--	4,155
Soft maple	16,110	2,743	200	28	1,595	125	--	--	--	--	7	2,903
Black oak	60,861	10,298	204	28	3,535	280	--	--	--	--	--	10,606
Red oak	82,402	13,943	2,416	330	3,267	257	--	--	--	--	2	14,532
White oak	64,617	10,932	4,549	622	4,757	377	--	--	5,156	850	3	12,784
Sweetgum	4,088	670	150	21	--	--	--	--	--	--	--	691
Sycamore	12,480	2,048	271	37	706	55	--	--	--	--	--	2,140
Black walnut	10,196	1,561	3,472	489	540	42	--	--	--	--	--	2,092
Yellow poplar	72,504	11,913	761	104	2,961	233	--	--	--	--	--	12,250
Other hardwoods	707	115	205	28	1,313	102	--	--	--	--	147	392
Total	435,419	72,577	16,744	2,304	37,926	2,992	6,835	1,108	5,156	850	173	80,004
SOFTWOODS												
Pine	289	51	21	3	--	--	--	--	--	--	3	57
Redcedar	100	21	--	--	--	--	--	--	--	--	39	60
Total	389	72	21	3	--	--	--	--	--	--	42	117
All species	435,808	72,649	16,765	2,307	37,926	2,992	6,835	1,108	5,156	850	215	80,121

LOWER WABASH UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Handle bolts		Cooperage logs		Other products	All products
	MBF 2/	*MCF 3/*	*MBF 2/*	*MCF 3/*	*Cords 4/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MCF 3/*	*MCF 3/*
HARDWOODS												
Ash	5,919	973	137	19	499	39	1,826	296	--	--	--	1,327
Aspen	51	8	--	--	476	36	--	--	--	--	--	44
Basswood	600	99	--	--	191	15	--	--	--	--	--	114
Beech	2,309	380	--	--	114	9	--	--	--	--	--	389
Birch	26	4	--	--	--	--	--	--	--	--	--	4
Blackgum	250	41	--	--	307	24	--	--	--	--	--	65
Black cherry	1,335	220	80	11	--	--	--	--	--	--	--	231
Cottonwood	2,332	362	--	--	1,584	126	--	--	--	--	13	501
Elm	451	74	--	--	--	--	--	--	--	--	--	74
Pecan hickory	397	66	273	37	--	--	--	--	--	--	--	103
Other hickory	6,197	1,019	--	--	3,202	254	--	--	--	--	--	1,273
Hard maple	2,947	502	253	35	1,043	82	--	--	--	--	--	619
Soft maple	4,541	773	80	11	754	59	--	--	--	--	7	850
Black oak	10,043	1,699	61	8	748	59	--	--	--	--	--	1,766
Red oak	18,350	3,105	535	73	695	54	--	--	--	--	--	3,232
White oak	12,283	2,078	805	110	644	51	--	--	855	141	--	2,380
Sweetgum	863	142	51	7	--	--	--	--	--	--	--	149
Sycamore	3,694	607	--	--	307	24	--	--	--	--	--	631
Black walnut	2,250	344	389	55	214	17	--	--	--	--	--	416
Yellow poplar	18,777	3,085	164	22	769	60	--	--	--	--	--	3,167
Other hardwoods	378	62	32	4	616	48	--	--	--	--	30	144
Total	93,993	15,643	2,860	392	12,163	957	1,826	296	855	141	50	17,479
SOFTWOODS												
Pine	--	--	--	--	--	--	--	--	--	--	--	--
Redcedar	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All species	93,993	15,643	2,860	392	12,163	957	1,826	296	855	141	50	17,479

KNOBS UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Handle bolts		Cooperage logs		Other products	All products
	MBF 2/	*MCF 3/*	*MBF 2/*	*MCF 3/*	*Cords 4/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MCF 3/*	*MCF 3/*
HARDWOODS												
Ash	12,351	2,029	128	18	1,402	111	1,035	168	--	--	--	2,326
Aspen	328	54	--	--	450	35	--	--	--	--	--	89
Basswood	865	142	7	1	218	18	--	--	--	--	--	161
Beech	5,588	919	3	--	1,002	80	--	--	--	--	--	999
Birch	78	12	--	--	--	--	--	--	--	--	--	12
Blackgum	995	163	15	2	291	23	--	--	--	--	--	188
Black cherry	4,908	806	107	15	--	--	--	--	--	--	--	821
Cottonwood	863	134	286	39	1,502	119	--	--	--	--	--	292
Elm	482	79	10	1	--	--	--	--	--	--	--	80
Pecan hickory	615	101	24	3	--	--	--	--	--	--	--	104
Other hickory	10,511	1,727	18	2	4,701	371	248	40	--	--	1	2,141
Hard maple	9,446	1,609	288	39	2,270	179	--	--	--	--	--	1,827
Soft maple	5,004	853	109	15	841	66	--	--	--	--	--	934
Black oak	30,561	5,171	66	9	2,787	221	--	--	--	--	--	5,401
Red oak	40,067	6,779	898	123	2,572	203	--	--	--	--	2	7,107
White oak	30,378	5,139	1,617	221	4,113	326	--	--	4,215	695	1	6,382
Sweetgum	2,389	392	99	14	--	--	--	--	--	--	--	406
Sycamore	3,976	652	239	33	399	31	--	--	--	--	--	716
Black walnut	3,577	548	622	87	326	25	--	--	--	--	--	660
Yellow poplar	40,102	6,589	450	62	2,192	173	--	--	--	--	--	6,824
Other hardwoods	193	31	41	6	697	54	--	--	--	--	26	117
Total	203,277	33,929	5,027	690	25,763	2,035	1,283	208	4,215	695	30	37,587
SOFTWOODS												
Pine	205	36	--	--	--	--	--	--	--	--	3	39
Redcedar	100	21	--	--	--	--	--	--	--	--	5	26
Total	305	57	--	--	--	--	--	--	--	--	8	65
All species	203,582	33,986	5,027	690	25,763	2,035	1,283	208	4,215	695	38	37,652

UPLAND FLATS UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Handle bolts		Cooperage logs		Other products	All products
	MBF 2/	*MCF 3/*	*MBF 2/*	*MCF 3/*	*Cords 4/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MCF 3/*	*MCF 3/*
HARDWOODS												
Ash	2,881	473	77	11	--	--	1,725	279	--	--	--	763
Aspen	211	34	--	--	--	--	--	--	--	--	--	34
Basswood	108	18	--	--	--	--	--	--	--	--	--	18
Beech	897	147	--	--	--	--	--	--	--	--	--	147
Birch	146	24	--	--	--	--	--	--	--	--	--	24
Blackgum	215	35	--	--	--	--	--	--	--	--	--	35
Black cherry	899	147	413	56	--	--	--	--	--	--	--	203
Cottonwood	350	55	--	--	--	--	--	--	--	--	--	55
Elm	49	8	--	--	--	--	--	--	--	--	--	8
Pecan hickory	4	1	--	--	--	--	--	--	--	--	--	1
Other hickory	1,012	166	27	4	--	--	--	--	--	--	--	170
Hard maple	1,299	221	76	10	--	--	690	112	--	--	--	343
Soft maple	1,048	178	--	--	--	--	--	--	--	--	--	178
Black oak	3,207	543	5	1	--	--	--	--	--	--	--	544
Red oak	6,464	1,094	468	64	--	--	--	--	--	--	--	1,158
White oak	4,801	813	830	114	--	--	--	--	86	14	1	942
Sweetgum	769	126	--	--	--	--	--	--	--	--	--	126
Sycamore	1,327	217	--	--	--	--	--	--	--	--	--	217
Black walnut	484	74	865	122	--	--	--	--	--	--	--	196
Yellow poplar	6,514	1,070	71	10	--	--	--	--	--	--	--	1,080
Other hardwoods	14	2	18	2	--	--	--	--	--	--	21	25
Total	32,699	5,446	2,850	394	--	--	2,415	391	86	14	22	6,267
SOFTWOODS												
Pine	--	--	--	--	--	--	--	--	--	--	--	--
Redcedar	--	--	--	--	--	--	--	--	--	--	34	34
Total	--	--	--	--	--	--	--	--	--	--	34	34
All species	32,699	5,446	2,850	394	--	--	2,415	391	86	14	56	6,301

NORTHERN UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Handle bolts		Cooperage logs		Other products	All products
	MBF 2/	*MCF 3/*	*MBF 2/*	*MCF 3/*	*Cords 4/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MBF 2/*	*MCF 3/*	*MCF 3/*	*MCF 3/*
HARDWOODS												
Ash	8,844	1,453	298	41	--	--	1,311	213	--	--	--	1,707
Aspen	47	7	--	--	--	--	--	--	--	--	--	7
Basswood	2,425	399	1	--	--	--	--	--	--	--	--	399
Beech	2,207	363	397	54	--	--	--	--	--	--	--	417
Birch	--	--	--	--	--	--	--	--	--	--	--	--
Blackgum	77	12	--	--	--	--	--	--	--	--	--	12
Black cherry	3,235	531	108	15	--	--	--	--	--	--	--	546
Cottonwood	5,418	841	178	24	--	--	--	--	--	--	--	865
Elm	524	86	--	--	--	--	--	--	--	--	--	86
Pecan hickory	271	44	1	--	--	--	--	--	--	--	--	44
Other hickory	3,501	575	33	5	--	--	--	--	--	--	--	580
Hard maple	6,990	1,191	1,278	175	--	--	--	--	--	--	--	1,366
Soft maple	5,517	939	11	2	--	--	--	--	--	--	--	941
Black oak	17,050	2,885	72	10	--	--	--	--	--	--	--	2,895
Red oak	17,521	2,965	515	70	--	--	--	--	--	--	--	3,035
White oak	17,155	2,902	1,297	177	--	--	--	--	--	--	1	3,080
Sweetgum	67	10	--	--	--	--	--	--	--	--	--	10
Sycamore	3,483	572	32	4	--	--	--	--	--	--	--	576
Black walnut	3,885	595	1,596	225	--	--	--	--	--	--	--	820
Yellow poplar	7,111	1,169	76	10	--	--	--	--	--	--	--	1,179
Other hardwoods	122	20	114	16	--	--	--	--	--	--	70	106
Total	105,450	17,559	6,007	828	--	--	1,311	213	--	--	71	18,671
SOFTWOODS												
Pine	84	15	21	3	--	--	--	--	--	--	--	18
Redcedar	--	--	--	--	--	--	--	--	--	--	--	--
Total	84	15	21	3	--	--	--	--	--	--	--	18
All species	105,534	17,574	6,028	831	--	--	1,311	213	--	--	71	18,689

1/ Based on factors obtained from the Illinois Utilization Study, 1984.

2/ Thousand board feet, International 1/4-inch rule.

3/ Thousand cubic feet.

4/ Standard cords are 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

Table 4.-- Material harvested on timberland for industrial roundwood by source of material and species group, Indiana, 1990 1/

(In thousand cubic feet)

Species group	Growing stock				Nongrowing stock						Total material used for products	Total material not used	Total material harvested
	Used for products				Used for products								
	Saw-timber	Pole-timber	Residue	TOTAL	Limb-wood	Sap-lings	Cull trees	Dead trees	Not used	TOTAL			
HARDWOODS													
Ash	5,522	200	2,185	7,907	218	--	134	49	3,070	3,471	6,123	5,255	11,378
Aspen	144	2	32	178	15	--	12	1	64	92	174	96	270
Basswood	646	2	196	844	33	--	5	6	410	454	692	606	1,298
Beech	1,828	3	546	2,377	87	--	15	19	1,126	1,247	1,952	1,672	3,624
Birch	39	--	12	51	1	--	--	--	26	27	40	38	78
Blackgum	271	2	76	349	17	--	8	2	156	183	300	232	532
Black cherry	1,718	--	519	2,237	67	--	--	16	1,065	1,148	1,801	1,584	3,385
Cottonwood	1,599	11	226	1,836	57	--	44	2	770	873	1,713	996	2,709
Elm	236	--	72	308	9	--	--	3	153	165	248	225	473
Hickory	3,983	33	1,154	5,170	252	--	107	41	2,305	2,705	4,416	3,459	7,875
Hard maple	3,837	33	1,059	4,929	207	--	76	2	1,970	2,255	4,155	3,029	7,184
Soft maple	2,712	6	731	3,449	146	--	39	--	1,527	1,712	2,903	2,258	5,161
Red oak	23,244	21	6,803	30,068	1,038	--	218	617	13,356	15,229	25,138	20,159	45,297
White oak	11,797	15	3,351	15,163	495	--	196	281	6,055	7,027	12,784	9,406	22,190
Sweetgum	659	--	201	860	26	--	0	6	419	451	691	620	1,311
Sycamore	2,021	2	614	2,637	88	--	9	20	1,277	1,394	2,140	1,891	4,031
Black walnut	1,756	2	159	1,917	35	--	49	--	216	300	1,842	375	2,217
Yellow poplar	11,574	9	3,549	15,132	505	--	46	116	7415	8,082	12,250	10,964	23,214
Other hardwoods	273	33	42	348	22	6	38	2	72	140	374	114	488
Total	73,859	374	21,527	95,760	3,318	6	996	1,183	41,452	46,955	79,736	62,979	142,715
SOFTWOODS													
Pine	55	1	6	62	--	1	--	--	15	16	57	21	78
Redcedar	29	19	--	48	--	10	--	2	6	18	60	6	66
Total	84	20	6	110	--	11	--	2	21	34	117	27	144
All species	73,943	394	21,533	95,870	3,318	17	996	1,185	41,473	46,989	79,853	63,006	142,859

1/ Based on factors obtained from the Illinois Utilization Study, 1984.

Table 5.--Saw-log production and receipts in Indiana by species group, 1984 and 1990

(In thousand board feet) 1/

Species group	Production			Receipts		
	1984	1990	Change	1984	1990	Change
HARDWOODS						
Ash	24,599	29,995	5,396	27,481	35,431	7,950
Aspen	794	637	-157	799	655	-144
Basswood	3,416	3,998	582	3,842	5,088	1,246
Beech	14,532	11,001	-3,531	15,146	12,063	-3,083
Birch	--	250	250	698	327	-371
Blackgum	2,024	1,537	-487	2,086	1,557	-529
Black cherry	6,543	10,377	3,834	7,513	12,420	4,907
Cottonwood	9,358	8,963	-395	9,626	9,378	-248
Elm	2,464	1,506	-958	2,865	1,937	-928
Pecan hickory	--	1,287	1,287	894	1,528	634
Other hickory	26,068	21,221	-4,847	27,512	25,392	-2,120
Hard maple	19,969	20,682	713	21,928	24,174	2,246
Soft maple	11,999	16,110	4,111	14,253	21,094	6,841
Red oak	113,552	143,263	29,711	125,954	166,435	40,481
White oak	47,552	64,617	17,065	52,657	76,294	23,637
Sweet gum	4,556	4,088	-468	4,718	4,118	-600
Sycamore	11,922	12,480	558	12,594	14,191	1,597
Black walnut	8,845	10,196	1,351	11,922	13,705	1,783
Yellow poplar	42,749	72,504	29,755	46,078	79,805	33,727
Other hardwoods	1,720	707	-1,013	1,123	735	-388
Total	352,662	435,419	82,757	389,689	506,327	116,638
SOFTWOODS						
Pine	613	289	-324	645	317	-328
Red cedar	234	100	-134	235	107	-128
Total	847	389	-458	880	424	-456
All species	353,509	435,808	82,299	390,569	506,751	116,182

1/ International 1/4-inch rule.

Table 6.--Saw-log production by Forest Survey Unit and species group, Indiana, 1990

(In thousand board feet)1/

Species group	Total	Lower Wabash Unit	Knobs Unit	Upland Flats Unit	Northern Unit
HARDWOODS					
Ash	29,995	5,919	12,351	2,881	8,844
Aspen	637	51	328	211	47
Basswood	3,998	600	865	108	2,425
Beech	11,001	2,309	5,588	897	2,207
Birch	250	26	78	146	--
Blackgum	1,537	250	995	215	77
Black cherry	10,377	1,335	4,908	899	3,235
Cottonwood	8,963	2,332	863	350	5,418
Elm	1,506	451	482	49	524
Pecan hickory	1,287	397	615	4	271
Other hickory	21,221	6,197	10,511	1,012	3,501
Hard maple	20,682	2,947	9,446	1,299	6,990
Soft maple	16,110	4,541	5,004	1,048	5,517
Black oak	60,861	10,043	30,561	3,207	17,050
Red oak	82,402	18,350	40,067	6,464	17,521
White oak	64,617	12,283	30,378	4,801	17,155
Sweetgum	4,088	863	2,389	769	67
Sycamore	12,480	3,694	3,976	1,327	3,483
Black walnut	10,196	2,250	3,577	484	3,885
Yellow poplar	72,504	18,777	40,102	6,514	7,111
Other hardwoods	707	378	193	14	122
Total	435,419	93,993	203,277	32,699	105,450
SOFTWOODS					
Pine	289	--	205	--	84
Redcedar	100	--	100	--	--
Total	389	--	305	--	84
State total	435,808	93,993	203,582	32,699	105,534

1/ International 1/4-inch rule.

Table 7.--Saw-log production by Forest Survey Unit, species group, and State of destination, Indiana, 1990

(In thousand board feet)1/

ALL UNITS

	All States	State of destination				
		Indiana	Illinois	Ohio	Michigan	Other States
HARDWOODS						
Ash	29,995	29,775	--	81	99	40
Aspen	637	637	--	--	--	--
Basswood	3,998	3,954	--	8	36	--
Beech	11,001	10,871	--	39	36	55
Birch	250	250	--	--	--	--
Blackgum	1,537	1,537	--	--	--	--
Black cherry	10,377	10,331	--	24	22	--
Cottonwood	8,963	8,369	558	--	36	--
Elm	1,506	1,451	55	--	--	--
Pecan hickory	1,287	1,259	--	28	--	--
Other hickory	21,221	21,095	--	43	48	35
Hard maple	20,682	20,520	--	64	62	36
Soft maple	16,110	15,960	55	39	44	12
Black oak	60,861	60,791	--	23	--	47
Red oak	82,402	80,964	229	166	525	518
White oak	64,617	64,238	--	134	162	83
Sweetgum	4,088	3,950	--	--	--	138
Sycamore	12,480	12,466	14	--	--	--
Black walnut	10,196	10,147	--	1	48	--
Yellow poplar	72,504	72,443	--	14	10	37
Other hardwoods	707	669	--	3	35	--
Total	435,419	431,677	911	667	1,163	1,001
SOFTWOODS						
Pine	289	289	--	--	--	--
Redcedar	100	100	--	--	--	--
Total	389	389	--	--	--	--
All species	435,808	432,066	911	667	1,163	1,001

1/ International 1/4-inch rule.

(Table 7 continued on next page)

(Table 7 continued)

	State of destination				
	All States	Indiana	Illinois	Ohio	Michigan	Other States
LOWER WABASH UNIT						
HARDWOODS						
Ash	5,919	5,919	--	--	--	--
Aspen	51	51	--	--	--	--
Basswood	600	600	--	--	--	--
Beech	2,309	2,309	--	--	--	--
Birch	26	26	--	--	--	--
Blackgum	250	250	--	--	--	--
Black cherry	1,335	1,335	--	--	--	--
Cottonwood	2,332	1,918	414	--	--	--
Elm	451	396	55	--	--	--
Pecan hickory	397	397	--	--	--	--
Other hickory	6,197	6,197	--	--	--	--
Hard maple	2,947	2,947	--	--	--	--
Soft maple	4,541	4,486	55	--	--	--
Black oak	10,043	10,043	--	--	--	--
Red oak	18,350	17,915	--	--	--	435
White oak	12,283	12,235	--	--	--	48
Sweetgum	863	863	--	--	--	--
Sycamore	3,694	3,680	14	--	--	--
Black walnut	2,250	2,250	--	--	--	--
Yellow poplar	18,777	18,777	--	--	--	--
Other hardwoods	378	378	--	--	--	--
Total	93,993	92,972	538	--	--	483
SOFTWOODS						
Pine	--	--	--	--	--	--
Redcedar	--	--	--	--	--	--
Total	--	--	--	--	--	--
All species	93,993	92,972	538	--	--	483
KNOBS UNIT						
HARDWOODS						
Ash	12,351	12,344	--	7	--	--
Aspen	328	328	--	--	--	--
Basswood	865	865	--	--	--	--
Beech	5,588	5,588	--	--	--	--
Birch	78	78	--	--	--	--
Blackgum	995	995	--	--	--	--
Black cherry	4,908	4,908	--	--	--	--
Cottonwood	863	863	--	--	--	--
Elm	482	482	--	--	--	--
Pecan hickory	615	615	--	--	--	--
Other hickory	10,511	10,511	--	--	--	--
Hard maple	9,446	9,446	--	--	--	--
Soft maple	5,004	5,004	--	--	--	--
Black oak	30,561	30,561	--	--	--	--
Red oak	40,067	40,032	--	35	--	--
White oak	30,378	30,364	--	14	--	--
Sweetgum	2,389	2,389	--	--	--	--
Sycamore	3,976	3,976	--	--	--	--
Black walnut	3,577	3,577	--	--	--	--
Yellow poplar	40,102	40,102	--	--	--	--
Other hardwoods	193	193	--	--	--	--
Total	203,277	203,221	--	56	--	--
SOFTWOODS						
Pine	205	205	--	--	--	--
Redcedar	100	100	--	--	--	--
Total	305	305	--	--	--	--
All species	203,582	203,526	--	56	--	--

(Table 7 continued on next page)

(Table 7 continued)

	State of destination					
	All States	Indiana	Illinois	Ohio	Michigan	Other States
UPLAND FLATS UNIT						
HARDWOODS						
Ash	2,881	2,775	--	66	--	40
Aspen	211	211	--	--	--	--
Basswood	108	100	--	8	--	--
Beech	897	803	--	39	--	55
Birch	146	146	--	--	--	--
Blackgum	215	215	--	--	--	--
Black cherry	899	875	--	24	--	--
Cottonwood	350	350	--	--	--	--
Elm	49	49	--	--	--	--
Pecan hickory	4	4	--	--	--	--
Other hickory	1,012	969	--	8	--	35
Hard maple	1,299	1,217	--	46	--	36
Soft maple	1,048	1,028	--	8	--	12
Black oak	3,207	3,152	--	8	--	47
Red oak	6,464	6,279	--	102	--	83
White oak	4,801	4,746	--	20	--	35
Sweetgum	769	631	--	--	--	138
Sycamore	1,327	1,327	--	--	--	--
Black walnut	484	483	--	1	--	--
Yellow poplar	6,514	6,463	--	14	--	37
Other hardwoods	14	11	--	3	--	--
Total	32,699	31,834	--	347	--	518
SOFTWOODS						
Pine	--	--	--	--	--	--
Redcedar	--	--	--	--	--	--
Total	--	--	--	--	--	--
All species	32,699	31,834	--	347	--	518
NORTHERN UNIT						
HARDWOODS						
Ash	8,844	8,737	--	8	99	--
Aspen	47	47	--	--	--	--
Basswood	2,425	2,389	--	--	36	--
Beech	2,207	2,171	--	--	36	--
Birch	--	--	--	--	--	--
Blackgum	77	77	--	--	--	--
Black cherry	3,235	3,213	--	--	22	--
Cottonwood	5,418	5,238	144	--	36	--
Elm	524	524	--	--	--	--
Pecan hickory	271	243	--	28	--	--
Other hickory	3,501	3,418	--	35	48	--
Hard maple	6,990	6,910	--	18	62	--
Soft maple	5,517	5,442	--	31	44	--
Black oak	17,050	17,035	--	15	--	--
Red oak	17,521	16,738	229	29	525	--
White oak	17,155	16,893	--	100	162	--
Sweetgum	67	67	--	--	--	--
Sycamore	3,483	3,483	--	--	--	--
Black walnut	3,885	3,837	--	--	48	--
Yellow poplar	7,111	7,101	--	--	10	--
Other hardwoods	122	87	--	--	35	--
Total	105,450	103,650	373	264	1,163	--
SOFTWOODS						
Pine	84	84	--	--	--	--
Redcedar	--	--	--	--	--	--
Total	84	84	--	--	--	--
All species	105,534	103,734	373	264	1,163	--

Table 8.--Saw-log receipts in Indiana by Forest Survey Unit, species group, and State of origin, 1990

(In thousand board feet)1/

ALL UNITS

Species group	All States	State of origin: Indiana	Illinois	Michigan	Kentucky	Ohio	Iowa	Other States
HARDWOODS								
Ash	35,431	29,775	1,482	1,954	1,149	1,051	17	3
Aspen	655	637	4	--	11	3	--	--
Basswood	5,088	3,954	83	888	30	118	10	5
Beech	12,063	10,871	352	665	68	107	--	--
Birch	327	250	--	77	--	--	--	--
Blackgum	1,557	1,537	4	--	16	--	--	--
Black cherry	12,420	10,331	282	1,114	318	349	3	23
Cottonwood	9,378	8,369	440	265	30	274	--	--
Elm	1,937	1,451	160	309	--	15	1	1
Pecan hickory	1,528	1,259	1	138	--	--	--	130
Other hickory	25,392	21,095	2,927	1,013	222	133	1	1
Hard maple	24,174	20,520	257	2,622	402	349	21	3
Soft maple	21,094	15,960	2,487	2,118	211	310	7	1
Black oak	70,506	60,791	3,643	2,840	2,223	988	4	17
Red oak	95,929	80,964	5,953	3,957	3,456	1,481	25	93
White oak	76,294	64,238	4,010	2,411	3,429	2,177	14	15
Sweetgum	4,118	3,950	140	1	26	1	--	--
Sycamore	14,191	12,466	698	798	102	127	--	--
Black walnut	13,705	10,147	721	804	542	1,481	6	4
Yellow poplar	79,805	72,443	3,516	1,402	2,186	247	7	4
Other hardwoods	735	669	30	6	30	--	--	--
Total	506,327	431,677	27,190	23,382	14,451	9,211	116	300
SOFTWOODS								
Pine	317	289	--	28	--	--	--	--
Redcedar	107	100	--	--	7	--	--	--
Total	424	389	--	28	7	--	--	--
All species	506,751	432,066	27,190	23,410	14,458	9,211	116	300

1/ International 1/4-inch rule.

(Table 8 continued on next page)

(Table 8 continued)

LOWER WABASH UNIT

Species group	All States	State of origin: Indiana	Illinois	Kentucky	Louisiana	Other States
HARDWOODS						
Ash	8,517	7,309	1,148	60	--	--
Aspen	45	41	4	--	--	--
Basswood	734	661	73	--	--	--
Beech	3,212	2,813	351	48	--	--
Birch	30	30	--	--	--	--
Blackgum	224	220	4	--	--	--
Black cherry	1,979	1,776	155	48	--	--
Cottonwood	2,322	1,856	440	26	--	--
Elm	593	436	157	--	--	--
Pecan hickory	675	544	1	--	73	57
Other hickory	8,698	6,033	2,617	48	--	--
Hard maple	3,458	3,239	159	60	--	--
Soft maple	6,293	4,098	2,128	67	--	--
Black oak	15,825	12,535	2,933	357	--	--
Red oak	24,385	19,572	4,456	357	--	--
White oak	17,882	14,459	3,066	357	--	--
Sweetgum	640	527	101	12	--	--
Sycamore	4,266	3,618	582	66	--	--
Black walnut	3,540	3,104	436	--	--	--
Yellow poplar	25,209	21,951	2,913	345	--	--
Other hardwoods	491	454	30	7	--	--
Total	129,018	105,276	21,754	1,858	73	57
SOFTWOODS						
Pine	--	--	--	--	--	--
Redcedar	--	--	--	--	--	--
Total	--	--	--	--	--	--
All species	129,018	105,276	21,754	1,858	73	57

KNOBS UNIT

Species group	All States	State of origin: Indiana	Kentucky	Illinois	Michigan	Other States
HARDWOODS						
Ash	11,635	10,939	503	193	--	--
Aspen	322	322	--	--	--	--
Basswood	727	723	--	--	--	4
Beech	5,413	5,393	20	--	--	--
Birch	125	48	--	--	77	--
Blackgum	1,024	1,016	8	--	--	--
Black cherry	4,744	4,502	138	87	--	17
Cottonwood	1,005	1,001	4	--	--	--
Elm	461	461	--	--	--	--
Pecan hickory	468	468	--	--	--	--
Other hickory	10,693	10,213	171	309	--	--
Hard maple	9,706	9,347	270	77	12	--
Soft maple	5,938	5,467	123	348	--	--
Black oak	29,790	27,955	1,255	580	--	--
Red oak	39,591	37,225	1,424	842	24	76
White oak	31,164	28,090	2,340	734	--	--
Sweetgum	2,950	2,897	14	39	--	--
Sycamore	4,257	4,108	33	116	--	--
Black walnut	2,804	2,506	143	155	--	--
Yellow poplar	39,520	37,666	1,283	571	--	--
Other hardwoods	186	157	23	--	6	--
Total	202,523	190,504	7,752	4,051	119	97
SOFTWOODS						
Pine	206	206	--	--	--	--
Redcedar	107	100	7	--	--	--
Total	313	306	7	--	--	--
All species	202,836	190,810	7,759	4,051	119	97

(Table 8 continued on next page)

(Table 8 continued)

UPLAND FLATS UNIT

Species group	All States	State of origin: Indiana	Kentucky	Ohio	Michigan	Other States
HARDWOODS						
Ash	2,308	1,775	421	112	--	--
Aspen	172	172	--	--	--	--
Basswood	142	106	30	6	--	--
Beech	551	550	--	1	--	--
Birch	172	172	--	--	--	--
Blackgum	240	232	8	--	--	--
Black cherry	740	609	84	46	1	--
Cottonwood	440	433	--	7	--	--
Elm	44	44	--	--	--	--
Pecan hickory	4	4	--	--	--	--
Other hickory	676	668	--	8	--	--
Hard maple	927	841	72	14	--	--
Soft maple	962	937	21	4	--	--
Black oak	2,457	1,872	446	139	--	--
Red oak	6,103	4,795	1,013	295	--	--
White oak	2,896	2,340	463	93	--	--
Sweetgum	385	385	--	--	--	--
Sycamore	1,308	1,301	--	7	--	--
Black walnut	1,950	883	275	769	23	--
Yellow poplar	5,591	4,998	492	101	--	--
Other hardwoods	3	3	--	--	--	--
Total	28,071	23,120	3,325	1,602	24	--
SOFTWOODS						
Pine	--	--	--	--	--	--
Redcedar	--	--	--	--	--	--
Total	--	--	--	--	--	--
All species	28,071	23,120	3,325	1,602	24	--

NORTHERN UNIT

Species group	All States	State of origin: Indiana	Michigan	Ohio	Kentucky	Other States
HARDWOODS						
Ash	12,971	9,752	1,954	939	165	161
Aspen	116	102	--	3	11	--
Basswood	3,485	2,464	888	112	--	21
Beech	2,887	2,115	665	106	--	1
Birch	--	--	--	--	--	--
Blackgum	69	69	--	--	--	--
Black cherry	4,957	3,444	1,113	303	48	49
Cottonwood	5,611	5,079	265	267	--	--
Elm	839	510	309	15	--	5
Pecan hickory	381	243	138	--	--	--
Other hickory	5,325	4,181	1,013	125	3	3
Hard maple	10,083	7,093	2,610	335	--	45
Soft maple	7,901	5,458	2,118	306	--	19
Black oak	22,434	18,429	2,840	849	165	151
Red oak	25,850	19,372	3,933	1,186	662	697
White oak	24,352	19,349	2,411	2,084	269	239
Sweetgum	143	141	1	1	--	--
Sycamore	4,360	3,439	798	120	3	--
Black walnut	5,411	3,654	781	712	124	140
Yellow poplar	9,485	7,828	1,402	146	66	43
Other hardwoods	55	55	--	--	--	--
Total	146,715	112,777	23,239	7,609	1,516	1,574
SOFTWOODS						
Pine	111	83	28	--	--	--
Redcedar	--	--	--	--	--	--
Total	111	83	28	--	--	--
All species	146,826	112,860	23,267	7,609	1,516	1,574

Table 9.--Pulpwood production in Indiana by species group, 1966, 1976, 1984, and 1990

(In standard cords, unpeeled)

Species group	1966	1976	1984	1990
ROUNDWOOD				
Soft hardwoods	45,365	17,555	14,912	11,594
Hard hardwoods	48,064	40,379	20,420	26,332
Softwoods	662	--	--	--
Total	94,091	57,934	35,332	37,926
RESIDUE				
Hardwood	2,349	114,060	170,568	151,108
Softwood	--	--	--	266
All material	96,440	171,994	205,900	189,300

Table 10.--Roundwood pulpwood production by Forest Survey Unit and species group in Indiana, 1990

(In standard cords, unpeeled)

Species group	All Units	Lower Wabash Unit	Knobs Unit	Upland Flats Unit	Northern Unit
ROUNDWOOD1/					
Ash	1,901	499	1,402	--	--
Aspen	926	476	450	--	--
Basswood	409	191	218	--	--
Beech	1,116	114	1,002	--	--
Blackgum	598	307	291	--	--
Cottonwood	3,086	1,584	1,502	--	--
Hickory	7,903	3,202	4,701	--	--
Hard maple	3,313	1,043	2,270	--	--
Soft maple	1,595	754	841	--	--
Red oak	6,802	1,443	5,359	--	--
White oak	4,757	644	4,113	--	--
Sycamore	706	307	399	--	--
Yellow poplar	2,961	769	2,192	--	--
Other hardwoods	1,853	830	1,023	--	--
Total	37,926	12,163	25,763	--	--

1/ Includes chips from roundwood.

Table 11.--Veneer log production in Indiana by species group, 1966, 1976, 1984, and 1990

(In thousand board feet)1/

Species group	1966	1976	1984	1990
Ash	381	609	461	640
Basswood	2	15	16	8
Black cherry	140	99	34	708
Cottonwood	1,129	668	383	464
Gum	502	386	165	165
Pecan hickory	732	354	231	298
Hard maple	1,080	273	234	1,895
Soft maple	36	266	314	200
Red oak	429	1,683	3,184	2,620
White oak	1,681	5,428	4,968	4,549
Sycamore	565	525	330	271
Walnut	6,412	3,426	2,889	3,472
Yellow-poplar	2,469	1,242	565	761
Other hardwoods	205	6	382	693
Pine	--	--	21	21
All species	17,729	16,956	14,177	16,765

1/ International 1/4-inch rule.

Table 12.--Veneer log and bolt production by species group and destination, Indiana, 1990

(In thousand board feet)1/

Species group	Total	Destination						
		Indiana	Ohio	Michigan	Kentucky	Iowa	Other States	Other countries
HARDWOODS								
Ash	640	510	50	3	33	--	34	10
Aspen	--	--	--	--	--	--	--	--
Basswood	8	6	--	--	--	--	--	2
Beech	400	277	116	7	--	--	--	--
Birch	--	--	--	--	--	--	--	--
Blackgum	15	15	--	--	--	--	--	--
Black cherry	708	681	15	6	6	--	--	--
Cottonwood	464	286	--	178	--	--	--	--
Elm	10	10	--	--	--	--	--	--
Pecan hickory	298	249	1	--	48	--	--	--
Other hickory	78	76	--	2	--	--	--	--
Hard maple	1,895	1,640	104	95	42	--	--	14
Soft maple	200	189	--	11	--	--	--	--
Black oak	204	204	--	--	--	--	--	--
Red oak	2,416	1,926	237	50	47	--	--	156
White oak	4,549	2,884	707	225	68	--	39	626
Sweetgum	150	150	--	--	--	--	--	--
Sycamore	271	239	32	--	--	--	--	--
Black walnut	3,472	1,993	1,311	9	80	63	--	16
Yellow poplar	761	761	--	--	--	--	--	--
Other hardwoods	205	94	34	75	2	--	--	--
Total	16,744	12,190	2,607	661	326	63	73	824
SOFTWOODS								
Pine	21	--	21	--	--	--	--	--
Redcedar	--	--	--	--	--	--	--	--
Total	21	--	21	--	--	--	--	--
All species	16,765	12,190	2,628	661	326	63	73	824

1/ International 1/4-inch rule.

Table 13.--Veneer log and bolt receipts in Indiana by species group and State of origin, 1990

(In thousand board feet)1/

Species group	Total	State of origin						
		Indiana	Penn-sylvania	Kentucky	Michigan	Ohio	Illinois	Other States
HARDWOODS								
Ash	1,300	510	23	42	29	135	100	461
Basswood	9	6	3	--	--	--	--	--
Beech	345	277	--	--	--	68	--	--
Birch	46	--	--	--	46	--	--	--
Blackgum	15	15	--	--	--	--	--	--
Black cherry	4,418	681	3,375	36	243	28	--	55
Cottonwood	286	286	--	--	--	--	--	--
Elm	10	10	--	--	--	--	--	--
Pecan hickory	2,952	249	--	--	--	--	--	2,703
Other hickory	147	76	--	1	2	68	--	--
Hard maple	4,118	1,640	57	141	1,909	291	--	80
Soft maple	189	189	--	--	--	--	--	--
Black oak	269	204	15	11	17	8	--	14
Red oak	4,260	1,926	1,389	144	478	230	--	93
White oak	9,909	2,884	72	2,274	150	695	1,528	2,306
Sweetgum	161	150	--	11	--	--	--	--
Sycamore	239	239	--	--	--	--	--	--
Black walnut	5,058	1,993	68	621	230	794	586	766
Yellow poplar	868	761	--	81	26	--	--	--
Other hardwoods	124	94	--	17	13	--	--	--
Total	34,723	12,190	5,002	3,379	3,143	2,317	2,214	6,478
SOFTWOODS								
Pine	40	--	--	--	--	--	--	40
Total	40	--	--	--	--	--	--	40
All species	34,763	12,190	5,002	3,379	3,143	2,317	2,214	6,518

1/ International 1/4-inch rule.

Table 14.--Growing-stock removals from timberland for industrial roundwood by Forest Survey Unit and species group, Indiana, 1990

(In thousand cubic feet)

Species group	Total	Lower Wabash Unit	Knobs Unit	Upland Flats Unit	Northern Unit
HARDWOODS					
Ash	7,907	1,744	2,900	1,058	2,205
Aspen	178	35	91	43	9
Basswood	844	134	191	22	497
Beech	2,377	479	1,200	184	514
Birch	51	5	16	30	--
Blackgum	349	68	221	44	16
Black cherry	2,237	287	1,023	248	679
Cottonwood	1,836	512	281	62	981
Elm	308	92	99	10	107
Pecan hickory	308	123	129	1	55
Other hickory	4,862	1,446	2,481	212	723
Hard maple	4,929	705	2,118	463	1,643
Soft maple	3,449	998	1,096	216	1,139
Black oak	12,665	2,103	6,410	656	3,496
Red oak	17,403	3,873	8,475	1,394	3,661
White oak	15,163	2,834	7,489	1,129	3,711
Sweetgum	860	185	505	157	13
Sycamore	2,637	774	874	271	718
Black walnut	1,917	379	601	182	755
Yellow poplar	15,132	3,913	8,405	1,345	1,469
Other hardwoods	348	137	102	19	90
Total	95,760	20,826	44,707	7,746	22,481
SOFTWOODS					
Pine	62	--	42	--	20
Redcedar	48	--	25	23	--
Total	110	--	67	23	20
State total	95,870	20,826	44,774	7,769	22,501

Table 15.--Sawtimber removals from timberland for industrial roundwood by Forest Survey Unit and species group, Indiana, 1990

(In thousand board feet) 1/

Species group	Total	Lower Wabash Unit	Knobs Unit	Upland Flats Unit	Northern Unit
HARDWOODS					
Ash	39,754	8,559	14,950	4,971	11,274
Aspen	909	167	461	230	51
Basswood	4,452	696	999	118	2,639
Beech	12,659	2,538	6,314	976	2,831
Birch	273	29	85	159	--
Blackgum	1,827	344	1,166	234	83
Black cherry	12,054	1,539	5,453	1,427	3,635
Cottonwood	10,652	2,878	1,562	365	5,847
Elm	1,649	490	535	54	570
Pecan hickory	1,723	728	694	5	296
Other hickory	25,262	7,486	12,804	1,129	3,843
Hard maple	25,385	3,632	10,823	2,157	8,773
Soft maple	17,652	5,101	5,601	1,108	5,842
Black oak	66,414	11,027	33,547	3,449	18,391
Red oak	91,907	20,452	44,626	7,451	19,378
White oak	80,445	15,044	39,418	6,143	19,840
Sweetgum	4,612	994	2,709	836	73
Sycamore	14,033	4,090	4,677	1,443	3,823
Black walnut	12,208	2,375	3,775	1,207	4,851
Yellow poplar	80,367	20,778	44,611	7,161	7,817
Other hardwoods	1,595	652	471	78	394
Total	505,832	109,599	235,281	40,701	120,251
SOFTWOODS					
Pine	320	--	211	--	109
Redcedar	111	--	98	13	--
Total	431	--	309	13	109
State total	506,263	109,599	235,590	40,714	120,360

1/ International 1/4-inch rule.

Table 16.--Harvest residue generated by industrial roundwood harvesting from timberland by Forest Survey Unit and species group, Indiana, 1990

(In thousand cubic feet)

Species group	Total	Lower Wabash Unit	Knobs Unit	Upland Flats Unit	Northern Unit
HARDWOODS					
Ash	5,255	1,117	1,995	644	1,499
Aspen	96	8	50	31	7
Basswood	606	92	132	16	366
Beech	1,672	348	846	135	343
Birch	38	4	12	22	0
Blackgum	232	39	150	32	11
Black cherry	1,584	204	744	146	490
Cottonwood	996	259	107	38	592
Elm	225	68	72	7	78
Pecan hickory	199	66	93	--	40
Other hickory	3,260	946	1,631	154	529
Hard maple	3,029	420	1,333	266	1,010
Soft maple	2,258	638	704	147	769
Black oak	8,540	1,410	4,292	449	2,389
Red oak	11,619	2,588	5,645	918	2,468
White oak	9,406	1,780	4,491	697	2,438
Sweetgum	620	132	362	116	10
Sycamore	1,891	558	607	200	526
Black walnut	375	76	121	31	147
Yellow poplar	10,964	2,838	6,067	984	1,075
Other hardwoods	114	59	32	2	21
Total	62,979	13,650	29,486	5,035	14,808
SOFTWOODS					
Pine	21	--	15	--	6
Redcedar	6	--	6	--	--
Total	27	--	21	--	6
State total	63,006	13,650	29,507	5,035	14,814

Table 17.-- Residue produced at primary wood-using mills by type of material, type of use, and Forest Survey Unit, Indiana, 1990

(In thousand tons, green weight)

Type of use	Wood residue: Total		Wood residue: Coarse 1/		Wood residue: Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
LOWER WABASH UNIT								
All counties								
Fiber products	--	104.31	--	104.31	--	--	--	0.07
Charcoal	--	--	--	--	--	--	--	--
Industrial fuel	--	40.14	--	4.29	--	35.85	--	3.89
Domestic fuel	--	39.87	--	39.87	--	--	--	1.80
Miscellaneous 3/	--	84.59	--	28.91	--	55.68	--	67.44
Not used	--	23.15	--	7.20	--	15.95	--	13.28
Total	--	292.06	--	184.58	--	107.48	--	86.48
KNOBS UNIT								
All counties								
Fiber products	--	184.97	--	184.35	--	0.62	--	--
Charcoal	--	0.31	--	--	--	0.31	--	0.19
Industrial fuel	0.05	87.02	--	23.02	0.05	64.00	--	14.84
Domestic fuel	0.20	63.44	0.20	60.90	--	2.54	0.02	6.20
Miscellaneous 3/	0.13	80.38	--	5.27	0.13	75.11	0.05	80.74
Not used	0.37	52.03	0.25	12.74	0.12	39.29	0.10	20.94
Total	0.75	468.15	0.45	286.28	0.30	181.87	0.17	122.91
UPLAND FLATS UNIT								
All counties								
Fiber products	--	26.78	--	26.78	--	--	--	--
Charcoal	--	--	--	--	--	--	--	--
Industrial fuel	--	6.22	--	0.02	--	6.20	--	--
Domestic fuel	--	15.67	--	13.45	--	2.22	--	2.89
Miscellaneous 3/	--	11.54	--	0.55	--	10.99	--	11.85
Not used	--	13.09	--	2.87	--	10.22	0.05	3.87
Total	--	73.30	--	43.67	--	29.63	0.05	18.61
NORTHERN UNIT								
All counties								
Fiber products	--	103.24	--	98.83	--	4.41	--	2.96
Industrial fuel	--	111.69	--	50.44	--	61.25	--	4.39
Domestic fuel	--	46.31	--	43.44	--	2.87	--	7.21
Miscellaneous 3/	0.23	70.88	0.14	9.27	0.09	61.61	0.06	57.38
Not used	0.01	26.05	0.01	13.04	--	13.01	--	22.89
Total	0.24	358.17	0.15	215.02	0.09	143.15	0.06	94.83
STATE TOTAL								
All counties								
Fiber products	--	419.30	--	414.27	--	5.03	--	3.03
Charcoal	--	0.31	--	--	--	0.31	--	0.19
Industrial fuel	0.05	245.07	--	77.77	0.05	167.30	--	23.12
Domestic fuel	0.20	165.29	0.20	157.66	--	7.63	0.02	18.10
Miscellaneous 3/	0.36	247.39	0.14	44.00	0.22	203.39	0.11	217.41
Not used	0.38	114.32	0.26	35.85	0.12	78.47	0.15	60.98
Total	0.99	1,191.68	0.60	729.55	0.39	462.13	0.28	322.83

1/ Suitable for chipping such as slabs, edgings, veneer cores, etc.

2/ Not suitable for chipping such as sawdust, veneer clippings, etc.

3/ Livestock bedding, mulch, small dimension, and specialty items.

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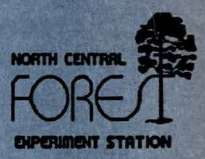
1993. **Indiana timber industry—an assessment of timber product output and use, 1990**. Resour. Bull. NC-146. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 35 p.

Discusses recent Indiana forest industry trends; production and receipts of pulpwood, saw logs, and veneer logs; and production of other timber products in 1990. Reports on harvest residue, on wood and bark residue generated at primary wood-using mills, and on disposition of this mill residue.

KEY WORDS: Pulpwood, saw logs, veneer logs, residue.

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.